

SEQUENCE LISTING

<110> Curagen
RASTELLI, LUCA

<120> NOVEL SPHINGOSINE KINASES AND NUCLEIC ACIDS ENCODING
SAME

<130> 10716-7

<140> NOT ASSIGNED

<141> 2001-02-14

<150> 60/182,360

<151> 2000-02-14

<150> 60/191,261

<151> 2000-03-22

<160> 15

<170> PatentIn Ver. 2.1

<210> 1

<211> 1600

<212> DNA

<213> Homo sapiens

<400> 1

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<210> 2

<211> 384

<212> PRT

<213> Homo sapiens

<400> 2

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```

```

Val Leu Val Leu Leu Asn Pro Arg Gly Gly Lys Gly Lys Ala Leu Gln
          20              25              30

```

```

Leu Phe Arg Ser His Val Gln Pro Leu Leu Ala Glu Ala Glu Ile Ser
    35              40              45

```

```

Phe Thr Leu Met Leu Thr Glu Arg Arg Asn His Ala Arg Glu Leu Val
    50              55              60

```

```

Arg Ser Glu Glu Leu Gly Arg Trp Asp Ala Leu Val Val Met Ser Gly
    65              70              75              80

```

```

Asp Gly Leu Met His Glu Val Val Asn Gly Leu Met Glu Arg Pro Asp
          85              90              95

```

```

Trp Glu Thr Ala Ile Gln Lys Pro Leu Cys Ser Leu Pro Ala Gly Ser
    100              105              110

```

```

Gly Asn Ala Leu Ala Ala Ser Leu Asn His Tyr Ala Gly Tyr Glu Gln
    115              120              125

```

```

Val Thr Asn Glu Asp Leu Leu Thr Asn Cys Thr Leu Leu Leu Cys Arg
    130              135              140

```

```

Pro Val Leu Ser Pro Met Asn Leu Leu Ser Leu His Thr Ala Ser Gly
    145              150              155              160

```

```

Leu Arg Ser Phe Ser Val Leu Ser Leu Ala Trp Gly Phe Ile Ala Asp
          165              170              175

```

Val	Asp	Leu	Glu	Ser	Asp	Lys	Tyr	Arg	Arg	Leu	Gly	Glu	Met	Arg	Phe	180	185	190
Thr	Leu	Gly	Thr	Phe	Leu	Arg	Leu	Ala	Ala	Leu	Arg	Thr	Tyr	Arg	Gly	195	200	205
Arg	Leu	Ala	Thr	Leu	Pro	Val	Gly	Arg	Val	Gly	Phe	Lys	Thr	Pro	Ala	210	215	220
Ser	Pro	Val	Val	Val	Gln	Gln	Gly	Pro	Val	Asp	Ala	His	Leu	Val	Pro	225	230	235
Leu	Glu	Glu	Gln	Val	Pro	Ser	His	Trp	Gln	Val	Val	Pro	Asp	Glu	Asp	245	250	255
Phe	Val	Leu	Val	Leu	Ala	Leu	Leu	His	Ser	His	Leu	Ala	Ser	Glu	Met	260	265	270
Phe	Ala	Ala	Pro	Met	Gly	Arg	Cys	Ala	Ala	Gly	Val	Met	His	Leu	Phe	275	280	285
Tyr	Val	Arg	Ala	Gly	Val	Ser	Arg	Ala	Met	Leu	Leu	Arg	Leu	Phe	Leu	290	295	300
Ala	Met	Glu	Lys	Gly	Arg	His	Met	Glu	Tyr	Glu	Cys	Pro	Tyr	Leu	Val	305	310	315
Tyr	Val	Pro	Val	Val	Ala	Phe	Arg	Leu	Glu	Pro	Lys	Asp	Gly	Lys	Gly	325	330	335
Val	Phe	Ala	Val	Asp	Gly	Glu	Leu	Met	Val	Ser	Glu	Ala	Val	Gln	Gly	340	345	350
Gln	Val	His	Pro	Asn	Tyr	Phe	Trp	Met	Val	Ser	Gly	Cys	Val	Glu	Pro	355	360	365
Pro	Pro	Ser	Trp	Lys	Pro	Gln	Gln	Met	Pro	Pro	Pro	Glu	Glu	Pro	Leu	370	375	380

<210> 3

<211> 1759

<212> DNA

<213> Mus musculus

<400> 3

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<210> 4

<211> 382

<212> PRT

<213> Mus musculus

<400> 4

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          20                      25                      30

Leu Phe Gln Ser Arg Val Gln Pro Phe Leu Glu Glu Ala Glu Ile Thr
    35                      40                      45

```

Phe	Lys	Leu	Ile	Leu	Thr	Glu	Arg	Lys	Asn	His	Ala	Arg	Glu	Leu	Val	50	55	60	
Cys	Ala	Glu	Glu	Leu	Gly	His	Trp	Asp	Ala	Leu	Ala	Val	Met	Ser	Gly	65	70	75	80
Asp	Gly	Leu	Met	His	Glu	Val	Val	Asn	Gly	Leu	Met	Glu	Arg	Pro	Asp	85	90	95	
Trp	Glu	Thr	Ala	Ile	Gln	Lys	Pro	Leu	Cys	Ser	Leu	Pro	Gly	Gly	Ser	100	105	110	
Gly	Asn	Ala	Leu	Ala	Ala	Ser	Val	Asn	His	Tyr	Ala	Gly	Tyr	Glu	Gln	115	120	125	
Val	Thr	Asn	Glu	Asp	Leu	Leu	Ile	Asn	Cys	Thr	Leu	Leu	Leu	Cys	Arg	130	135	140	
Arg	Arg	Leu	Ser	Pro	Met	Asn	Leu	Leu	Ser	Leu	His	Thr	Ala	Ser	Gly	145	150	155	160
Leu	Arg	Leu	Tyr	Ser	Val	Leu	Ser	Leu	Ser	Trp	Gly	Phe	Val	Ala	Asp	165	170	175	
Val	Asp	Leu	Glu	Ser	Glu	Lys	Tyr	Arg	Arg	Leu	Gly	Glu	Ile	Arg	Phe	180	185	190	
Thr	Val	Gly	Thr	Phe	Phe	Arg	Leu	Ala	Ser	Leu	Arg	Ile	Tyr	Gln	Gly	195	200	205	
Gln	Leu	Ala	Tyr	Leu	Pro	Val	Gly	Thr	Val	Ala	Ser	Lys	Arg	Pro	Ala	210	215	220	
Ser	Thr	Leu	Val	Gln	Lys	Gly	Pro	Val	Asp	Thr	His	Leu	Val	Pro	Leu	225	230	235	240
Glu	Glu	Pro	Val	Pro	Ser	His	Trp	Thr	Val	Val	Pro	Glu	Gln	Asp	Phe	245	250	255	
Val	Leu	Val	Leu	Val	Leu	Leu	His	Thr	His	Leu	Ser	Ser	Glu	Leu	Phe	260	265	270	
Ala	Ala	Pro	Met	Gly	Arg	Cys	Glu	Ala	Gly	Val	Met	His	Leu	Phe	Tyr	275	280	285	
Val	Arg	Ala	Gly	Val	Ser	Arg	Ala	Ala	Leu	Leu	Arg	Leu	Phe	Leu	Ala	290	295	300	

Met Gln Lys Gly Lys His Met Glu Leu Asp Cys Pro Tyr Leu Val His
 305 310 315 320

Val Pro Val Val Ala Phe Arg Leu Glu Pro Arg Ser Gln Arg Gly Val
 325 330 335

Phe Ser Val Asp Gly Glu Leu Met Val Cys Glu Ala Val Gln Gly Gln
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Val His Pro Asn Tyr Leu Trp Met Val Cys Gly Ser Arg Asp Ala Pro
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Ser Gly Arg Asp Ser Arg Arg Gly Pro Pro Pro Glu Glu Pro
 370 375 380

<210> 5

<211> 1840

<212> DNA

<213> Homo sapiens

<400> 5

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<210> 6

<211> 471

<212> PRT

<213> Homo sapiens

<400> 6

Met	Glu	Lys	Pro	Tyr	Ala	Phe	Thr	Val	His	Cys	Val	Lys	Arg	Ala	Arg
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Arg	His	Arg	Trp	Lys	Trp	Ala	Gln	Val	Thr	Phe	Trp	Cys	Pro	Glu	Glu
			20					25					30		
Gln	Leu	Cys	His	Leu	Trp	Leu	Gln	Thr	Leu	Arg	Glu	Met	Leu	Glu	Lys
		35					40					45			
Leu	Thr	Ser	Arg	Pro	Lys	His	Leu	Leu	Val	Phe	Ile	Asn	Pro	Phe	Gly
	50					55					60				
Gly	Lys	Gly	Gln	Gly	Lys	Arg	Ile	Tyr	Glu	Arg	Lys	Val	Ala	Pro	Leu
65					70					75					80
Phe	Thr	Leu	Ala	Ser	Ile	Thr	Thr	Asp	Ile	Ile	Gly	Asn	Lys	Phe	Tyr
				85					90					95	
Val	Asn	Tyr	Val	Glu	Val	Ile	Thr	Glu	His	Ala	Asn	Gln	Ala	Lys	Glu
			100					105					110		
Thr	Leu	Tyr	Glu	Ile	Asn	Ile	Asp	Lys	Tyr	Asp	Gly	Ile	Val	Cys	Val
		115					120					125			
Gly	Gly	Asp	Gly	Met	Phe	Ser	Glu	Val	Leu	His	Gly	Leu	Ile	Gly	Arg
		130				135					140				
Thr	Gln	Arg	Ser	Ala	Gly	Val	Asp	Gln	Asn	His	Pro	Arg	Ala	Val	Leu
145					150					155					160
Val	Pro	Ser	Ser	Leu	Arg	Ile	Gly	Ile	Ile	Pro	Ala	Gly	Ser	Thr	Asp
				165					170					175	
Cys	Val	Cys	Tyr	Ser	Thr	Val	Gly	Thr	Ser	Asp	Ala	Glu	Thr	Ser	Ala

445

Pro Lys Pro Asp Ser His Ser
465 470

<210> 7
<211> 522
<212> DNA
<213> Rattus sp.

<400> 7						
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<210> 8
<211> 144
<212> PRT
<213>* Rattus sp.
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<400> 8
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Pro Gly Gly Leu Ser Pro Phe Ala His Leu Gly Asp Gly Ser Ser Asp
20 25 30

Leu Ile Leu Ile Arg Lys Cys Ser Arg Phe Asn Phe Leu Arg Phe Leu
35 40 45

Ile Arg His Thr Asn Gln Glu Asp Gln Phe Gly Phe Thr Phe Val Glu
50 55 60

Val	Tyr	Arg	Val	Lys	Lys	Phe	Gln	Phe	Thr	Ser	Lys	His	Val	Glu	Asp
65					70					75					80

Asp Asp Asn Asp Leu Lys Glu Leu Glu Lys Gln Lys Phe Gly Gln Ile

95

His Cys Gln Leu Val Arg Leu Phe Ala Arg Gly Ile Glu Glu Glu Ser
130 135 140

<213> Mus musculus

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aagcaagaac	cccaaagccc	aggagctgtc	ggccttgagc	tcggggagtg	tggaaattac	300
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<213> Mus musculus

Cys Asp Gly Glu Val Met His Ser Pro Ala Ile Glu Val Arg Val His
50 55 60

Cys Gln Leu Val Arg Leu Phe Ala Arg Gly Ile Glu Glu Glu Ser
65 70 75

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<210> 11
<211> 326
<212> PRT
<213> Homo sapiens
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Gly Lys Arg Ile Tyr Glu Arg Lys Val Ala Pro Leu Phe Thr Leu Ala
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Glu Val Ile Thr Glu His Ala Asn Gln Ala Lys Glu Thr Leu Tyr Glu
50 55 60

Met Phe Ser Glu Val Leu His Gly Leu Ile Gly Arg Thr Gln Arg Ser
85 90 95

Ala Gly Val Asp Gln Asn His Pro Arg Ala Val Leu Val Pro Ser Ser
 ' 100 105 110

Leu Arg Ile Gly Ile Ile Pro Ala Gly Ser Thr Asp Cys Val Cys Tyr
115 120 125

Ser Thr Val Gly Thr Ser Asp Ala Glu Thr Ser Ala Leu His Ile Val
130 135 140

Val	Gly	Asp	Ser	Leu	Ala	Met	Asp	Val	Ser	Ser	Val	His	His	Asn	Ser
145					150					155					160

Thr Leu Leu Arg Tyr Ser Val Ser Leu Leu Gly Tyr Gly Phe Tyr Gly
165 170 175

Asp Ile Ile Lys Asp Ser Glu Lys Lys Arg Trp Leu Gly Leu Ala Arg
180 185 190

Tyr Asp Phe Ser Gly Leu Lys Thr Phe Leu Ser His His Cys Tyr Glu
195 200 205

Gly Thr Val Ser Phe Leu Pro Ala Gln His Thr Val Gly Ser Pro Arg
210 215 220

Asp	Arg	Lys	Pro	Cys	Arg	Ala	Gly	Cys	Phe	Val	Cys	Arg	Gln	Ser	Lys
225					230					235					240

Gln Gln Leu Glu Glu Glu Gln Lys Lys Ala Leu Tyr Gly Leu Glu Ala
245 250 255

Ala Glu Asp Val Glu Glu Trp Gln Val Val Cys Gly Lys Phe Leu Ala
260 265 270

Ile Asn Ala Thr Asn Met Ser Cys Ala Cys Arg Arg Ser Pro Arg Gly
275 280 285

Leu Ser Pro Ala Ala His Leu Gly Asp Gly Ser Ser Asp Leu Ile Leu
290 295 300

Ile Arg Lys Cys Ser Arg Phe Asn Phe Leu Arg Phe Leu Ile Arg His
305 310 315 320

Thr Asn Gln Gln Asp Gln
325

<210> 12

<211> 453

<212> PRT

<213>* *Saccharomyces cerevisiae*

<400> 12

Leu Tyr Ile Asp Tyr Lys Pro His Ser Ser Ser His Leu Lys Glu Glu
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Asp Asp Leu Val Glu Glu Ile Leu Lys Arg Ser Tyr Lys Asn Thr Arg
20 25 30

Arg Asn Lys Ser Ile Phe Val Ile Ile Asn Pro Phe Gly Gly Lys Gly .
35 40 45

Lys Ala Lys Lys Leu Phe Met Thr Lys Ala Lys Pro Leu Leu Leu Ala
50 55 60

Ser Arg Cys Ser Ile Glu Val Val Tyr Thr Lys Tyr Pro Gly His Ala
65 70 75 80

Ile Glu Ile Ala Arg Glu Met Asp Ile Asp Lys Tyr Asp Thr Ile Ala

95

Cys	Ala	Ser	Gly	Asp	Gly	Ile	Pro	His	Glu	Val	Ile	Asn	Gly	Leu	Tyr	
			100			105						110				
Gln	Arg	Pro	Asp	His	Val	Lys	Ala	Phe	Asn	Asn	Ile	Ala	Ile	Thr	Glu	
			115			120						125				
Ile	Pro	Cys	Gly	Ser	Gly	Asn	Ala	Met	Ser	Val	Ser	Cys	His	Trp	Thr	
			130			135						140				
Asn	Asn	Pro	Ser	Tyr	Ser	Thr	Leu	Cys	Leu	Ile	Lys	Ser	Ile	Glu	Thr	
145						150						155			160	
Arg	Ile	Asp	Leu	Met	Cys	Cys	Ser	Gln	Pro	Ser	Tyr	Ala	Arg	Glu	His	
			165						170						175	
Pro	Lys	Leu	Ser	Phe	Leu	Ser	Gln	Thr	Tyr	Gly	Leu	Ile	Ala	Glu	Thr	
			180						185						190	
Asp	Ile	Asn	Thr	Glu	Phe	Ile	Arg	Trp	Met	Gly	Pro	Ala	Arg	Phe	Glu	
			195						200						205	
Leu	Gly	Val	Ala	Phe	Asn	Ile	Ile	Gln	Lys	Lys	Lys	Tyr	Pro	Cys	Glu	
210						215						220				
Ile	Tyr	Val	Lys	Tyr	Ala	Ala	Lys	Ser	Lys	Asn	Glu	Leu	Lys	Asn	His	
225						230						235			240	
Tyr	Leu	Glu	His	Lys	Asn	Lys	Gly	Ser	Leu	Glu	Phe	Gln	His	Ile	Thr	
			245						250						255	
Met	Asn	Lys	Asp	Asn	Glu	Asp	Cys	Asp	Asn	Tyr	Asn	Tyr	Glu	Asn	Glu	
			260						265						270	
Tyr	Glu	Thr	Glu	Asn	Glu	Asp	Glu	Asp	Glu	Asp	Ala	Asp	Ala	Asp	Asp	
275									280						285	
Glu	Asp	Ser	His	Leu	Ile	Ser	Arg	Asp	Leu	Ala	Asp	Ser	Ser	Ala	Asp	
290						295						300				
Gln	Ile	Lys	Glu	Glu	Asp	Phe	Lys	Ile	Lys	Tyr	Pro	Leu	Asp	Glu	Gly	
305						310						315			320	
Ile	Pro	Ser	Asp	Trp	Glu	Arg	Leu	Asp	Pro	Asn	Ile	Ser	Asn	Asn	Leu	
			325						330						335	
Gly	Ile	Phe	Tyr	Thr	Gly	Lys	Met	Pro	Tyr	Val	Ala	Ala	Asp	Thr	Lys	

340

345

350

Phe Phe Pro Ala Ala Leu Pro Ser Asp Gly Thr Met Asp Met Val Ile
 355 360 365

Thr Asp Ala Arg Thr Ser Leu Thr Arg Met Ala Pro Ile Leu Leu Gly
 370 375 380

Leu Asp Lys Gly Ser His Val Leu Gln Pro Glu Val Leu His Ser Lys
 385 390 395 400

Ile Leu Ala Tyr Lys Ile Ile Pro Lys Leu Gly Asn Gly Leu Phe Ser
 405 410 415

Val Asp Gly Glu Lys Phe Pro Leu Glu Pro Leu Gln Val Glu Ile Met
 420 425 430

Pro Arg Leu Cys Lys Thr Leu Leu Arg Asn Gly Arg Tyr Val Asp Thr
 435 440 445

Asp Phe Asp Ser Met
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<210> 13

<211> 436

<212> PRT

<213> *Saccharomyces cerevisiae*

<400> 13

Leu Leu Ile Asp His Val Ser Arg Lys Ser Arg Ala Asn Thr Gly Glu
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Glu Asn Ile Ser Ser Gly Thr Val Glu Glu Ile Leu Glu Lys Ser Tyr
 20 25 30

Glu Asn Ser Lys Arg Asn Arg Ser Ile Leu Val Ile Ile Asn Pro His
 35 40 45

Gly Gly Lys Gly Thr Ala Lys Asn Leu Phe Leu Thr Lys Ala Arg Pro
 50 55 60

Ile Leu Val Glu Ser Gly Cys Lys Ile Glu Ile Ala Tyr Thr Lys Tyr
 65 70 75 80

Ala Arg His Ala Ile Asp Ile Ala Lys Asp Leu Asp Ile Ser Lys Tyr
 85 90 95

Asp	Thr	Ile	Ala	Cys	Ala	Ser	Gly	Asp	Gly	Ile	Pro	Tyr	Glu	Val	Ile	100	105	110
Asn	Gly	Leu	Tyr	Arg	Arg	Pro	Asp	Arg	Val	Asp	Ala	Phe	Asn	Lys	Leu	115	120	125
Ala	Val	Thr	Gln	Leu	Pro	Cys	Gly	Ser	Gly	Asn	Ala	Met	Ser	Ile	Ser	130	135	140
Cys	His	Trp	Thr	Asn	Asn	Pro	Ser	Tyr	Ala	Ala	Leu	Cys	Leu	Val	Lys	145	150	155
Ser	Ile	Glu	Thr	Arg	Ile	Asp	Leu	Met	Cys	Cys	Ser	Gln	Pro	Ser	Tyr	165	170	175
Met	Asn	Glu	Trp	Pro	Arg	Leu	Ser	Phe	Leu	Ser	Gln	Thr	Tyr	Gly	Val	180	185	190
Ile	Ala	Glu	Ser	Asp	Ile	Asn	Thr	Glu	Phe	Ile	Arg	Trp	Met	Gly	Pro	195	200	205
Val	Arg	Phe	Asn	Leu	Gly	Val	Ala	Phe	Asn	Ile	Ile	Gln	Gly	Lys	Lys	210	215	220
Tyr	Pro	Cys	Glu	Val	Phe	Val	Lys	Tyr	Ala	Ala	Lys	Ser	Lys	Lys	Glu	225	230	235
Leu	Lys	Val	His	Phe	Leu	Glu	Asn	Lys	Asp	Lys	Asn	Lys	Gly	Cys	Leu	245	250	255
Thr	Phe	Glu	Pro	Asn	Pro	Ser	Pro	Asn	Ser	Ser	Pro	Asp	Leu	Leu	Ser	260	265	270
Lys	Asn	Asn	Ile	Asn	Asn	Ser	Thr	Lys	Asp	Glu	Leu	Ser	Pro	Asn	Phe	275	280	285
Leu	Asn	Glu	Asp	Asn	Phe	Lys	Leu	Lys	Tyr	Pro	Met	Thr	Glu	Pro	Val	290	295	300
Pro	Arg	Asp	Trp	Glu	Lys	Met	Asp	Ser	Glu	Leu	Thr	Asp	Asn	Leu	Thr	305	310	315
Ile	Phe	Tyr	Thr	Gly	Lys	Met	Pro	Tyr	Ile	Ala	Lys	Asp	Thr	Lys	Phe	325	330	335
Phe	Pro	Ala	Ala	Leu	Pro	Ala	Asp	Gly	Thr	Ile	Asp	Leu	Val	Ile	Thr	340	345	350

Asp Ala Arg Ile Pro Val Thr Arg Met Thr Pro Ile Leu Leu Ser Leu
355 360 365

Asp Lys Gly Ser His Val Leu Glu Pro Glu Val Ile His Ser Lys Ile
370 375 380

Leu Ala Tyr Lys Ile Ile Pro Lys Val Glu Ser Gly Leu Phe Ser Val
385 390 395 400

Asp Gly Glu Lys Phe Pro Leu Glu Pro Leu Gln Val Glu Ile Met Pro
405 410 415

Met Leu Cys Lys Thr Leu Leu Arg Asn Gly Arg Tyr Ile Asp Thr Glu
420 425 430

Phe Glu Ser Met
435

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<211> 380
<212> PRT
<213> Schizosaccharomyces pombe
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Leu Asp Val Ala Tyr Lys Gly Ile Lys Arg Ser Arg Arg Phe Ile Val
 * 20 25 30

Phe Ile Asn Pro His Gly Gly Lys Gly Lys Ala Lys His Ile Trp Glu
35 40 45

Ser Glu Ala Glu Pro Val Phe Ser Ser Ala His Ser Ile Cys Glu Val
50 55 60

Val	Leu	Thr	Arg	Arg	Lys	Asp	His	Ala	Lys	Ser	Ile	Ala	Lys	Asn	Leu
65					70					75					80

Asp Val Gly Ser Tyr Asp Gly Ile Leu Ser Val Gly Gly Asp Gly Leu
85 90 95

Phe His Glu Val Ile Asn Gly Leu Gly Glu Arg Asp Asp Tyr Leu Glu
100 105 110

Ala Phe Lys Leu Pro Val Cys Met Ile Pro Gly Gly Ser Gly Asn Ala
115 120 125

Phe Ser Tyr Asn Ala Thr Gly Gln Leu Lys Pro Ala Leu Thr Ala Leu
130 135 140
Glu Ile Leu Lys Gly Arg Pro Thr Ser Phe Asp Leu Met Thr Phe Glu
145 150 155 160
Gln Lys Gly Lys Lys Ala Tyr Ser Phe Leu Thr Ala Asn Tyr Gly Ile
165 170 175
Ile Ala Asp Cys Asp Ile Gly Thr Glu Asn Trp Arg Phe Met Gly Glu
180 185 190
Asn Arg Ala Tyr Leu Gly Phe Phe Leu Arg Leu Phe Gln Lys Pro Asp
195 200 205
Trp Lys Cys Ser Ile Glu Met Asp Val Val Ser Ser Asp Arg Thr Glu
210 215 220
Ile Lys His Met Tyr Glu Lys Ser Lys Asn Leu Ala Pro Met Ser Glu
225 230 235 240
Ser Ser Asp Ser Asp Lys Thr Val Ser Thr Ser Pro Glu Ser His Leu
245 250 255
Leu Thr Phe Glu Ile Asn Asp Leu Ser Ile Phe Cys Ala Gly Leu Leu
260 265 270
Pro Tyr Ile Ala Pro Asp Ala Lys Met Phe Pro Ala Ala Ser Asn Asp
275 280 285
Asp Gly Leu Ile Asp Val Val Ile Val Tyr Ser Lys Gln Phe Arg Lys
290 295 300
Ser Leu Leu Ser Met Phe Thr Gln Leu Asp Asn Gly Gly Phe Tyr Tyr
305 310 315 320
Ser Lys His Leu Asn Tyr Tyr Lys Val Arg Ser Phe Arg Phe Thr Pro
325 330 335
Val Asn Thr Gly Lys Arg His Tyr Phe Ala Leu Asp Gly Glu Ser Tyr
340 345 350
Pro Leu Glu Pro Phe Glu Cys Arg Val Ala Pro Lys Leu Gly Thr Thr
355 360 365
Leu Ser Pro Val Ala Gly Phe Gln Leu Leu Asp Ile
370 375 380

<210> 15

<211> 415

<212> PRT

<213> Caenorhabditis elegans

<400> 15

Cys Arg Ser Asp Ala Glu Glu Asn Glu Gln Leu Thr Ser Val Ile Leu
1 5 10 15

Ser Arg Lys Pro Pro Pro Gln Glu Gln Cys Arg Gly Asn Leu Leu Val
20 25 30

Phe Ile Asn Pro Asn Ser Gly Thr Gly Lys Ser Leu Glu Thr Phe Ala
35 40 45

Asn Thr Val Gly Pro Lys Leu Asp Lys Ser Leu Ile Arg Tyr Glu Val
50 55 60

Val Val Thr Thr Gly Pro Asn His Ala Arg Asn Val Leu Met Thr Lys
65 70 75 80

Ala Asp Leu Gly Lys Phe Asn Gly Val Leu Ile Leu Ser Gly Asp Gly
85 90 95

Leu Val Phe Glu Ala Leu Asn Gly Ile Leu Cys Arg Glu Asp Ala Phe
100 105 110

Arg Ile Phe Pro Thr Leu Pro Ile Gly Ile Val Pro Ser Gly Ser Gly
115 120 125

Asn Gly Leu Leu Cys Ser Val Leu Ser Lys Tyr Gly Thr Lys Met Asn
130 135 140

Glu Lys Ser Val Met Glu Arg Ala Leu Glu Ile Ala Thr Ser Pro Thr
145 150 155 160

Ala Lys Ala Glu Ser Val Ala Leu Tyr Ser Val Lys Thr Asp Asn Gln
165 170 175

Ser Tyr Ala Ser Phe Leu Ser Ile Gly Trp Gly Leu Met Ala Asp Ile
180 185 190

Asp Ile Asp Ser Glu Lys Trp Arg Lys Ser Leu Gly His His Arg Phe
195 200 205

Thr Val Met Gly Phe Ile Arg Ser Cys Asn Leu Arg Ser Tyr Lys Gly

210 215 220
 Arg Leu Thr Tyr Arg Pro Tyr Lys Pro Lys Gly Phe His Pro Ser Ser
 225 230 235 240
 Asn Val Phe Ser Val Tyr Glu Lys Thr Thr Gln Gln Arg Ile Asp Asp
 245 250 255
 Ser Lys Val Lys Thr Asn Gly Ser Val Ser Asp Ser Glu Glu Glu Thr
 260 265 270
 Met Glu Thr Lys Phe Gln Asn Trp Thr Leu Pro Asp Ser Asp Glu Thr
 275 280 285
 Leu Ala Val Gly Ser Ser Asp Leu Glu Glu Thr Val Val Ile Glu Asp
 290 295 300
 Asn Phe Val Asn Ile Tyr Ala Val Thr Leu Ser His Ile Ala Ala Asp
 305 310 315 320
 Gly Pro Phe Ala Pro Ser Ala Lys Leu Glu Asp Asn Arg Ile His Leu
 325 330 335
 Ser Tyr Ile Leu Trp Lys Asp Ile Gly Thr Arg Val Asn Ile Ala Lys
 340 345 350
 Tyr Leu Leu Ala Ile Glu His Glu Thr His Leu Asp Leu Pro Phe Val
 355 360 365
 Lys His Val Glu Val Ser Ser Met Lys Leu Glu Val Ile Ser Glu Gly
 370 375 380
 Ser His Val Val Leu Asp Gly Glu Val Val Asp Thr Lys Thr Ile Glu
 385 390 395 400
 Val Ala Ser Thr Lys Asn His Ile Ser Val Phe Ser Ser Thr Ala
 405 410 415